



Coweta-Fayette



# powerlines

## LEARNING IN 3D

*How local teachers are using 3D printers in the classroom*

Walking into Amanda Foiles' class of 4th graders at Welch Elementary School in Newnan seemed like any other classroom. Colorful drawings and posters filled the walls. Students walked through the door to take their seats.

However, when Foiles started the activity on habitats, students didn't break out their crayons to start drawing. They reached for their Chrome Books and started designing three-dimensional models for the classroom's 3D printer.

The old days of overhead projectors and markers are over. Thanks to Coweta-Fayette EMC's Bright Ideas grant, innovative local teachers are getting 3D printers in their classrooms.

Foiles walked over to a small 3D printer, a black box with "Makerbot" written on the front. One student uploaded his finished design, and the printer started forming the model from melted plastic filament, which comes out thin like fishing wire.

Seeing a 3D printer at a STEM (Science, Technology, Engineering and Math) conference inspired Foiles. She wanted one in her classroom. That's when she applied to and won a CFEMC Bright Ideas grant in 2017.

Foiles said her students feel a sense of ownership with their printed designs. The printer allows them to take creative chances they might not normally take.

Foiles recognizes the value of utilizing this technology in the classroom. "It's exposing them to the design process," she said. "It is teaching these kids what will be expected in the work place."

Sharon McClellan, STEM teacher at Welch Elementary, bought two 3D printers with her grant. McClellan teaches STEM on a weekly rotation with other classes like art, music and physical education.



McClellan used the printers with her 4th and 5th grade students. She's used the printer to teach lessons ranging from modeling animal cells to finding measurements of 3D printed houses.

Like her students, McClellan had never used a 3D printer before getting the grant. She's seen the importance of letting her students know they are learning together. "If it doesn't work the first time, we go back and try it again," she said.

At Huddleston Elementary School in Peachtree City, Kathryn Floyd purchased a 3D printer with her 2017 Bright Ideas grant money.

"Right now, they're kind of exploring it," she said. The first thing the students made was a blue blob. "They named it Bobby," she laughed.

Floyd says her students, who range from nine to twelve years in age, are developing better spatial reasoning from working in three dimensions. After trial and error, the students are getting more comfortable with the design process.

"They're fearless," she said.

Floyd's students aim to compete in the next Georgia Tech InVenture Challenge. They'll be using the printer for rapid prototyping.

Orla Thomas of Northgate High School in Newnan uses her 3D printer to teach skills in entrepreneurship and engineering. "Most of my students want to do engineering," she said.

Thomas purchased her printer after winning the 2017 Bright Ideas grant.

Her students competed in the 2017 Coweta Innovation Expo. "It's kind of like the Coweta County version of Shark Tank," she said. The students worked on a project together and pitched their ideas to local innovation

experts. Two of Thomas' student groups qualified in the competition.

"They were in each morning at 7:30 am to work on it," she said.

One group of Thomas' students went to the Georgia Tech InVenture Challenge. They used Tinkercad, a design platform, to create their designs. The students produced technical drawings and two or three prototypes as a part of the design process.

The goal was to create a hollow mesh structure to attach to a drone. The structure needed to hold an instrument for testing air quality. The drone would then use the attachment to carry the instrument at an altitude. The instrument would analyze air quality over industrial sites.

"It's been a wonderful experience for them," said Thomas. "I am so eternally grateful!"

Coweta-Fayette EMC believes in bringing innovation into the classroom. Our Bright Ideas grant program awards dozens of local teachers each year to fund creative educational projects. The 2018 Bright Ideas application cycle is open until August 14, 2018. Please visit our website at [utility.org](http://utility.org) to apply.

770-502-0226

WWW.UTILITY.ORG



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A LOOK INSIDE THIS ISSUE:

CEO'S MESSAGE - 2

SUMMER STORM PREP - 2

# HOW WE PREPARE FOR SUMMER STORMS BEFORE THEY STRIKE

**OUR SERVICE AREA IS PRONE TO LIGHTNING AND BIG STORMS LATE IN THE AFTERNOON.**

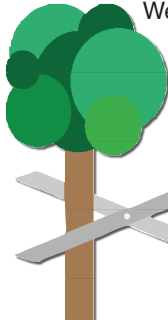
Look at the **FIVE MAIN WAYS** we prepare for these storms and make our system resilient.

## 1. NIGHT SHIFT



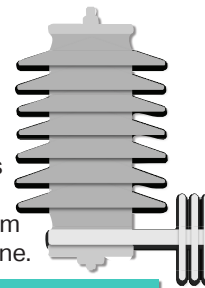
From **MAY THROUGH SEPTEMBER**, some of our linemen work from **AFTERNOON TO EVENING** when intense summer storms are likely.

## 2. RIGHT OF WAY MAINTENANCE



We **TRIM 500 MILES** and **MOW 500 MILES** each year, especially in the spring and summer, to prevent trees and branches from falling on our lines after a storm.

## 3. LIGHTNING ARRESTORS

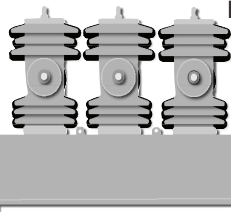


These devices **PROTECT AGAINST EXCESS VOLTAGE** on the line. We install arrestors every .25 miles since our system is lightning-prone.

**NOTE:** Nothing can fully protect against a direct lightning strike.

## 4. RECLOSING SWITCHES

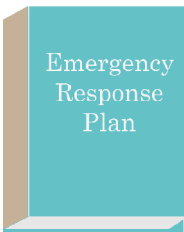
Reclosers detect and interrupt temporary short-circuits. If a tree limb hits the line and clears itself, the recloser will detect this and open once it's cleared, preventing a prolonged outage.



If your lights blink on and off during a storm, that might be a recloser checking to see if it's safe to bring the power back!

## 5. EMERGENCY RESPONSE PLAN

If storm damage is widespread, our supervisors follow an emergency response plan to respond to serious situations.



### ORDER OF OPERATIONS ISN'T JUST FOR MATH PROBLEMS.

Fixing the transformer in front of your house won't help if there's an issue at the substation. If you have an outage and see our trucks pass by your house, fear not! Our crews need to fix certain issues first before they can address others.

## The President's Message



*Chris Stephens*  
CEO

Over the past couple of years, there has been an increased emphasis on the security of our systems, both from a cyber and physical point of view. When I talk about systems, I am referring to our internal network system and electric distribution system. Due to elevated risk, we place a significant amount of emphasis on security.

We have a dedicated staff of IT professionals who manage our internal network. Our security protection measures include a mix of physical, technical, operational and management controls designed to provide concurrent identification, protection, detection, response and recovery of any security threats. Examples of these controls include: 24-7 security monitoring by our security operations center, firewalls to protect systems from the internet, further isolation of critical systems from non-critical systems, physical and electronic access control systems, as well as several physical and electronic intrusion detection systems. We maintain our systems to remediate software flaws and routinely conduct security vulnerability assessments to identify and remediate both cyber and physical security vulnerabilities. We provide regular cyber security training and awareness to employee and test their proficiency in detecting issues like phishing.

We have similar systems in place monitoring our critical infrastructure in the field, including cameras to help provide a visual image in case of an event. We work closely with our G&T (generation and transmission) company who must comply with the North American Reliability Council (NERC) Critical Infrastructure Protection (CIP) Standards. These mandatory security standards for the bulk electric system ensure the protection of the electric grid across North America. They require asset categorization, security management, personnel and training, boundary protection, physical security, system security, incident response, recovery, configuration management, vulnerability assessment and information security. Our G&T conducts regular internal audits and receives regular external regulatory audits to ensure they are compliant with all standards.

Security is an ever-increasing challenge. Whether for cyber systems, physical systems, or the electric grid itself, we incorporate redundancy and resiliency in our designs to protect Coweta-Fayette EMC from all hazards, natural or man-made. Just know that from the standpoint of making sure we supply you with the reliable flow electricity, we have an outstanding team of IT professionals here at CFEMC and within our G&T that are always working to secure the systems.

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